forming a plasma having an ion density of at least 1×10^{11} ions/cm^3 from said process gas; and

biasing the plasma during deposition of the silicon oxide layer to generate a sputter etching component simultaneous with film deposition, wherein the plasma heats the substrate to a temperature at or above 500°C during deposition of the silicon oxide layer.

29. (New) The method of claim 28 wherein the sputtering element of the deposition process slows deposition on corners of raised surfaces the silicon oxide layer is deposited over thereby contributing to the increased gapfill capability of the silicon oxide layer.

30. (New) The method of claim 29 wherein the silicon oxide layer is used as a premetal dielectric layer or part of a shallow trench isolation structure.

31. (New) The method of claim 30 wherein said silicon oxide layer has a fluorine content of 0.6 at. % or less.

32. (New) The method of claim 31 wherein said silicon-containing gas is SiH_4.

33. (New) The method of claim 32 wherein said oxygen-containing source is O_2.

34. (New) The method of claim 1 wherein the silicon oxide layer is doped with phosphorus and said process gas further comprises a phosphorus-containing source.

35. (New) The method of claim 34 wherein said phosphorus-containing source is PH_3.

36. (New) The method of claim 10 wherein the silicon oxide layer is doped with phosphorus and said process gas further comprises a phosphorus-containing source.

37. (New) The method of claim 36 wherein said phosphorus-containing source is PH_3.